Wilcox Oil SAP Comments from OSRTI Site Team

Comment #	Reference (page, table, figure)	Comment	Group	KMHC THOUGHTS
1	General Section 1.1.1	The goals laid out in the this section ("complete the characterization of Wilcox Oil by delineating and defining the contamination present at the site" for "soil, surface water, sediment, ground water, and through vapor intrusion") and the mechanisms proposed to reach those goals (primarily discrete soil sampling) present a comprehensive and traditional approach to conducting an RI in phases. Each area is addressed individually and thoroughly using traditional sampling approaches for an extended suite of potential COCs. The comprehensive approach includes certain contaminants “for completeness” and a large number of discrete sample locations for investigation and delineation. The overall objectives of the RI could be met using a streamlined approach that incorporates the phased approach but addresses the highest exposure and migration risk and areas with potential for early actions in the first phase, and more detailed nature and extent, risk and feasibility data collection in the later phases.	GENERAL	OK. We are doing phases and addressing areas thought to be of importance when it comes to exposure and migration.
2	General	The CSM should be revised to address all CSM elements as described in EPA’s “Best Practices for Site Characterization throughout Remediation” course. These elements include: (1) past use, (2) previous investigations, (3) geology and hydrogeology, (4) intended reuse, (5) decision criteria, (6) pathway-receptor network, (7) potential remedies, and (8) completion strategy. The draft SAP for Wilcox discusses past use, geology and hydrogeology, and the pathway-receptor network in sufficient detail but does not adequately address (1) previous investigations (especially the data gap discussions in the SERAS report), (2) intended reuse, (3) decision criteria to guide the investigation, (4) potential remedies, including potential early actions to address ongoing source areas that contribute to contaminant migration and longer-term actions which would constitute the final remedy for the site, and (5) completion strategies for both the RI/FS and remedy selection phases and for the site as a whole. Some of these CSM elements will be less developed than others, but they should all be on the “radar” of the project team and serve as continuing discussion points throughout the life of the investigative and remedial activities for this site.	GENERAL	Add additional discussion in a CSM section to specifically address these bullets. Previous investigations discussed and ERT report--Section 1.1.4. The reuse is expected to be residential, and we will evaluate the residential as well as the industrial/construction worker scenarios. Decisioin criteria are the Site questions/decisioin statements--section 1.3.3.
3	General	The SAP should consider use of the Triad approach as a way to increase the value obtained from the first phase of sampling. Real-time technologies could potentially be used to obtain immediate data and allow adjustments to characterization activities while the field team is still mobilized. This approach has the potential to eliminate or reduce the need for characterization efforts in subsequent phases of the RI/FS.	GENERAL	Is this not in line with TRIAD--phased approach to guide the next set of actions? What are the suggestions. We will be using XRF. What other realtime technologies are there that can get me risk quality information? investigation benefit the project if we believe theat the LIF provided guidance for delineation? Why do an additional screening instead of collecting data for a risk evaluation?
4	General	There does not seem to be a strong connection between the data collection effort and the conduct of the Screening Level Ecological Risk Assessment (SLERA). The SAP should clarify how the data collected will be used in the ecological risk assessment.	GENERAL	Section 1.3.3 and 1.3.6 discuss the study qeustions and decision statements. 1.3.4 discusses screening numbers and 1.2 indicates this info will be used to determine the mneed for additional work (e.g., toxicity) Clarify whether SW/sed data indicate a n eed for toxicity tests.

5	General	Any sampling and analysis conducted for dioxin, whether in Phase 1 or subsequent phases, should follow EPA's guidance prepared for the dioxin reassessment at: https://www.epa.gov/superfund/site-evaluation-dioxin-superfund-sites The approach applies an incremental composite sample (ICS) methodology to obtain samples and analytical data that are representative of the average exposure across the area sampled (the decision unit). This method also allows the 95% Upper Concentration Limit (UCL) of the mean to be calculated.	GENERAL	OK.
6	General	The project team should evaluate the use of real-time technologies for all COPCs, including lead and PCBs. In addition, field-based decision criteria should be developed for real-time technologies for use in decision logic that will guide any additional sampling to be conducted while the field crew is mobilized for the Phase 1 activities. Examples of real time technologies include XRF, field test kits, mobile laboratories, ultraviolet fluorescence (UVF), and Laser Induced Fluorescence (LIF).	GENERAL	XRF is being used and LIF was used. Field screening still needs definitive lab data for risk.
7	Section 1.1.4 Page 6 of 96	The results for the Residential soil sampling conducted in June 2015 do not appear to be presented in the SAP and should be added and discussed. The results should be used to re-assess the sampling strategy to develop a more streamlined approach.	GENERAL	ok. These data were used to detemine that pesticides and PCBs are not a concern for soils in the East Tank Farm area. PAHs are of primary concern due to exceedances of RSL.
8	Section 1.2 Page 17+	The use of an exposure, migration and early action approach, described in comment 1 above, is consistent with the overall RI Project objectives in 1.2.1, but section 1.2.2 should be revised to better reflect the this approach. 1.2.2.1 – Phase 1 to address high priority exposure and migration threats to quickly move into early actions 1.2.2.2 Phase 2 to complete contaminant fate and transport site characterization for the human health and ecological risk assessments for the land use	GENERAL	We are doing a phased approached by using multiple mobilizations.
9	Section 1.3	DQOs This section should be revised to reflect the exposure, migration and early action approach, described in comment 1 above. Specific comments on the subsections are provided below.	GENERAL	
10	Section 1.3.2.1 Page 23	"The current land use across the site is residential." It would be beneficial to designate expected future land uses for the site so that exposure assumptions are consistent with, and support possible early actions. For example, is it reasonable to assume that a former heavy industrial area (refinery process areas) would be zoned as residential? The text could reflect the possibility that other less restrictive land uses could be designated for areas of the site, if agreed upon by the stakeholders.	GENERAL	We will be evaluating residential and industrial/commercial scenarios.
11	Section 1.3.2.1 Page 23	"In addition, for completeness, a select number of shallow surface soil samples (0.0–0.5 ft. bgs) from the process areas (5 percent) will undergo the following analyses…" The SAP describes discrete soil samples in several areas for these contaminants. Numerous studies by EPA have demonstrated that discrete soil samples for these and other contaminants are not likely to be representative of the distribution of contaminants or likely exposures. All references to discrete soil samples for contaminant distribution or exposure should be reviewed and considered for incremental soil sample methodology. Use of incremental soil sampling will reduce the uncertainty and improve decision making. Development of ICS sampling will require definition of Decision Units for each area (discussed in later comments)	SSS SWGW SWGW OSOURCE BKGD	Delineation with discrete sampling. ICS for areas not expected to be ocntaminated to support risk review.

12	Section 1.3.2.1 Page 24	“Soil Exposure Medium - • Confirm presence of contamination in soil below waste piles across the site” Also: “Waste Material- • Characterize waste piles across the site, and assess impacts to soil immediately below the waste piles.” The exposure scenario for soil below waste piles is unclear. Can these samples be collected using a rapid assessment technology, such as ultraviolet fluorescence or field test kits in the field as part of an early action to remove waste piles? It would be reasonable to assume that waste piles will not be left onsite under any likely use scenario so the sampling is more appropriately related to the early action.	OSOURCE	At this time, early action has not been a high priorty for this site. Especially since the agency is not funding new RA starts for projects at the RA stage. Potential leeaching information to assist with the detemination on whether a full GW study is necessary.
13	Section 1.3.2.1 Page 24	"Groundwater Exposure Medium" The RI should also clarify the classification of the shallow zone on top of the sandstone or clay layer and the underlying regional aquifer. Each unit should be classified in accordance with EPA guidance to help identify beneficial uses and potential cleanup levels. The SAP also states that the perched water has no beneficial use, however, if it discharges to Sand Creek, then recharge of Sand Creek may be considered a beneficial use.	SWGW	First, it needs to be determined whether water actually exists in the shallow zone. During Rost/LIF no water was encountered in significant amount. What water was encountered appears to be related to 'valley' in the refusal layer where it has pooled.
14	Section 1.3.3.1	Principal Study Questions (PSQ) The PSQs could be revised to better reflect the exposure, migration, and early action phased approach. Each phase could be addressed by a different set of PSQs. These changes would require changes to the Alternative Actions and Decision Statements.	GENERAL	Could be, but are they adequate such that time and effort is not expended just to revise them for more verbage?
15	Section 1.3.2.2	Our understanding is that downgradient surface water receptors may include tribal communities. Are the tribes represented in the stakeholders?	GENERAL	Yes. They are to be included.
16	Section 1.3.3.2 Page 27	"Alternative Actions" The potential actions are quite general. The actions, especially for those areas already known to present a potential threat, should be more specific to ensure the appropriate data are collected to evaluate the actions.	GENERAL	Minor changes can be made.
17	1.3.4.1	Determine Source of Contamination 2nd bullet "Geologic and hydrogeologic information (e.g., soil borings, new monitoring wells, pump testing, clay permeability testing, etc.) will be used…" The SAP does not include any pump testing or soil/clay permeability testing. Reference to these procedures should be removed.	GENERAL	Can be clarified for mobiliztion 2 if it is determined to be necessary.
18	Section 1.3.4.1 Page 30	"Determine if Exposure to COPCs Pose a Potential Unacceptable Risk to Human Health and Ecological Receptors (Tables 4-1 through 4-6)" Removal management levels should also be added as screening values and compared to existing data and the data to be collected. Exceedance of RMLs may indicate the need for an early action. A discussion and table of RMLs can be found at https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls	GENERAL	This can be done.

19	1.3.6.1 Page 35	Population Parameters The paragraph should be revised to reflect the preferred use of Incremental Composite Sampling methodology. Maximum exposure unit concentrations (as provided by incremental samples having at least 30 increments) will be used first to determine if a chemical should be kept as a site COPC. If COPCs are identified, the 95% upper confidence limit of the mean (95UCL) will be calculated using ProUCL Version 5.0.0 (EPA 2013b, 2013c) and used in the risk assessments. The past use and previous investigations for the site indicate that unique exposure areas for the site do exist. In addition, the site is rather large and treating it as a single exposure area (it is unclear if this is the case) would not be representative. The uncertainty associated with how and where exposure areas will be defined for risk assessment purposes in combination with the uncertainty associated with discrete soil samples being representative will compound the difficultly in conducting the risk assessment using exposure point concentrations (maximum value or 95UCL) to quantify human health risk. The SAP should be revised to better delineate exposure areas. This statement was deleted: "Maximum values will be used if the 95UCL cannot be calculated or the calculated 95UCL is greater than the maximum value (EPA 1989)." The RAGs guidance included using the maximum because of the problems with calculating UCLs with limited numbers of highly variable discrete samples. For incremental samples, a 95% UCL should be used for risk assessment, not a maximum concentration.	GENERAL	May be able to use ICS for drainages, ponds, and background. ICS may be used for remaining soils in mob 2? See additional thoughts below.
20	1.3.6.2	The action level decision rules should be restated to describe how decisions will be made for taking early action and how decisions will be made for determining the need for long-term actions based on the human health and ecological risk assessments. As stated, the risk assessments will be performed when screening levels are exceeded. However, a baseline risk assessment is required by the NCP for both human health and ecological risks. The data collected should provide enough information to conduct the human health and ecological risk assessments for those areas of the site that are not subject to early action.	GENERAL	The action level decision statement is correct. If the screening shows no reason to go forward then the assessment is done.
21	1.3.7.1 38/39	Sampling and Measurement Error Sampling error can be quantified and reduced in soils through the use of ICS. Soil sampling should consider the use of ICS with associated replicate samples to identify, quantify and reduce sampling error.	GENERAL	
22	Section 2.1 Page 49	For the phased approach to sampling proposed by OSRTI, the principal study questions could be revised to reflect: · highest potential exposure areas · migration pathways in surface water and sediment · areas which may be candidates for early action in the remedial process	GENERAL	they could be--but are these questions wrong? They would still need to be answered no matter how the investigation was phased. Each of these questions will apply to each of these bullets, so essentially, to answere the questions the project is phased into different mobilization efforts.

23	2.3.4 Page 56	Several sections within 2.3.4 - Soil Exposure Media Investigation proposes collection of soil samples for various uses. The soil sampling methodologies for the residential exposure analysis (0-2 foot or 0.5 to 2 foot) interval are described in SOP 25 and use a whole core composite sample from a single location. This method results in a composite of the top 0-2 foot interval in a single location and does not provide any understanding of the spatial distribution of contamination across the area of concern. Discrete samples also do not provide an understanding of the representativeness of the concentration; that is, the sampling error, which is an important quality control parameter to determine to reduce decision error. The SAP should consider use of Decision Units and Incremental Composite Sampling (ICS) around each source, removal, or exposure area to provide more useful information for decision making. ICS also provides a better understating of sample representativeness.	SSS SWGW SWGW OSOURCE BKGD PHASE2	Suggested proceedure forward---Use discrete to define. Draw the 'delineation boundary' based on the ROST/LIF/Soil Borings. Mob 2: define DU for ICS.
24	2.3.4.7 Page 59	Soil samples are proposed in drainages for ecological and residential risk determination. What is the basis for residential risk exposure in a drainage? Consider using an ecological risk driver only for drainages. Soil samples in drainages can also be collected using the ICS methodology to identify potential exposure. Decision units for drainages could be developed based on proximity to sources or sensitive habitats.	SWGW	The sample will be collected and compared to tresspasser and eco screening numbers. Because these are 0- 0.5ft, ICS may be doable since the drainages are not too long and there are only 5-6 of them.All processing will have to be done in the field--Houston/CLP doesn't have the capability of lab prep for ICS.
25	2.3.4.9	Lead Sweetening area soil sampling should use ICS and result in a removal decision area. The focus of the sampling should be on the delineation of the edge of the exposure area, and potential migration routes. The collection of samples in the known high concentration area is not necessary.	SSS	We agreed to focus on the outer premeter and the vertical. If no lab data are needed, (as I interpreted the methodology) then we can do this and better define this area.
26	2.3.4.10 Page 62	Soil Background Sampling The SAP describes collecting 10 discrete samples from random grids in a 50 by 50 foot area for estimating concentration of background contaminants in surface soils (0-0.5 feet). Numerous studies by EPA have demonstrated that discrete soil samples for these and other contaminants are not likely to be representative of the distribution of contaminants or likely exposures, and its approach would not accurately represent a statistically valid background sample. The background sampling approach should incorporate Incremental Composite Sampling (ICS) to accurately represent the concentration of these COPCs in surface soil. The plan might also consider the use of subsurface background (0-2 foot) for residential screening.	BKGD	To establish background the use of ICS may be doable since it will be one area with samples collected from 0-0.5 ft. It was discussed that we would use the upper 6in as our background screen data for all samples collected from the site. All processing will have to be done in the field--Houston/CLP doesn't have the capability of lab prep for ICS.
27	2.3.5.3 Page 63	"Additional surface water and sediment samples will be collected from seeps, the location in Sand Creek just below the seep, as well as from sand bar locations immediately downstream from the seeps; however, the seep locations could not be identified on Figure 13 at this time." Thermal Infrared imaging, such as Forward Looking Infrared (FLIR) can be used to aid in the identification of seeps and discharges along Sand Creek. As a screening technique the method can assess large areas rapidly to focus site specific reconnaissance and sampling.	SWGW	ODEQ has a thermal camer that we can use to screen the creek. Information can be used to focus sediment and surface water sampling. Is there any data on Sand Creek that indicates whether it is a gaining or losing stream?
28	2.3.5.3 Page 63	Surface Water and Sediment Sampling for ponds Surface water and sediment samples are proposed for several ponds at the site. Since each pond is a separate exposure unit, the SAP should consider designating each as a Decision Unit and collecting sediment a sample using the Incremental Composite Sampling approach. The results of the sample would be representative of the entire exposure area for decision making, and offer statistical information to assess representativeness.	SWGW	The use of ICS may be doable since it will include samples collected from 0-0.5 ft, the ponds are relatively shallow, and there are 7.All processing will have to be done in the field--Houston/CLP doesn't have the capability of lab prep for ICS.

29	2.3.6.1 Page 67	Sampling of Tap Water from Residential Wells The well at the church is reported to have LNAPL. Water samples collected from inactive wells with LNAPL are not representative of the water in the well and should not be collected. A sample of LNAPL should be collected and archived for future petroleum fingerprint and mobility analysis. During well abandonment water from the well can be evacuated and tested for disposal. The church well may have LNAPL, if there is a potential that similar construction or contaminant migration has occurred in the other wells, active and inactive, they should be checked for LNAPL using a high resolution oil water interface probe.	RW	All residential wells will be sampled. Lorraine well will be investigated--purged, viewed with a camera, LNAPL sampled, contruction confirmed, and attempts to identify LNAPL infiltration location. Abandonment to follow.
30	2.3.6 Page 68	Church well abandonment The well at the church is reported to have LNAPL which is believed to originate from the shallow contaminated soils and migrated into the well through the casing. In its current condition, and given the limited knowledge about the well construction and water bearing zones, it serves no purpose for investigation, and may continue to act as a conduit for contamination to the regional aquifer. If this well is suspected to be a source and migration pathway, it should be removed and properly abandoned as soon as possible so that it no longer acts as a conduit to the deeper regional aquifer. The church well should be logged to collect any easily available information about construction and flow, an then abandoned. Logging suite should include, at a minimum, a video camera, gamma, fluid conductivity, and temperature tool.	RW	
31	2.3.7 Page 68	Vapor intrusion sampling consisting of sub-slab soil gas, indoor air, and ambient air sampling is proposed for the residence and church on the Lorraine Process Area and the residence in the northern portion of the Wilcox Process Area. The residence and church on the Lorraine Process Area are not occupied. There is an additional residence on the Wilcox Process Area between Tank Farms 11 and 12 which is not proposed for vapor intrusion sampling during Phase 1. If this residence is occupied then it is recommended that it be part of the Phase 1 vapor intrusion investigation. It sits between two areas of contamination identified by the ROST investigation associated with Tank Farms 11 and 12 and is the closest residence to the perched water taken from location AA-GW-03 and which contained 2,400 ug/L of benzene. The text should be clarified to indicate which of the residences slated for Phase 1 vapor intrusion sampling are currently occupied.	IA	Since these structures are unoccupied and it has been noted vapors exist, the pathway will need to be evaluated for any potential reuse options should it be detemined that contamination is left in place such that mitigation options can be considered. Other residential properties are not located above sources. IF VI results show potential or actual, then soil gas will be used as a first step for occupied residences and will be used to assist with decision makeing related to full VI sampling within those homes.
32	Table 10	Table 10 proposes vapor intrusion sampling using Summa Canisters at the three residences. Were alternative methods considered, such as the use of passive samplers, especially for the currently unoccupied residence and church on the Lorraine Process Area? If passive samplers are available for the contaminants of concern, they may be a lower cost approach for the unoccupied structures included in the vapor intrusion investigation. Table 10 shows soil gas sampling in the tank farm areas and the text discusses conducting this sampling based on the results of vapor intrusion sampling for the three structures on the Lorraine Process Area and Wilcox Process Area. It is unclear if the soil gas sampling is considered part of Phase 1 or if it is a Phase 2 activity. If it is a Phase 2 activity, it should be removed from Table 10.	IA	Passive samplers--we discuss the potential but were not convinced that they would provide sufficient data for our suite of contaminants. Luis/Christina/Teri--is this right?

33	Tables 7 and 8	The selection of analytical parameters can be streamlined by more careful selection of COPCs to avoid collecting samples "for completeness". There appears to be enough information being collected on other contaminants and potential exposure areas to focus the sampling on most likely contaminants that drive future actions (risk and removal). A logical approach may be to select key driver contaminants to support risk identification and removal actions, in a rational and acceptable (to stakeholders) way.	COPCs
34	page 6	"The ROST LIF survey data will have to be correlated with analytical data to determine if this is an adequate tool for screening contamination at the site." The ROST LIF results and conclusions presented in the SERAS report offer a valuable screening tool for planning further delineation, and do not need further analytical data for correlation. A description of the application and use of the ROST LIF is provided in the attached SAP comments from Tom Kady, EPA ERT.	OSOURCE
35	Section 1.4.2.3 page 42	"Representativeness expresses the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter at a sampling point, or an environmental condition that they are intended to represent. For this project, representative data will be obtained through careful selection of sampling locations and analytical parameters. Representative data will also be obtained through proper collection and handling of samples to avoid interference and minimize contamination." The first sentence is true, however the proposed mechanisms for how to ensure representativeness are incorrect or insufficient. The characteristics of a heterogeneous population cannot be known from a single discrete sample. The representativeness of soil data is attained by controlling for the effects of soil heterogeneity at 2 spatial scales (sample collection in the field, and subsampling of the field sample in the laboratory). Incremental sampling procedures do both of these; discrete sampling and routine lab analyses do not.	GENERAL

Phil? Delineation sampling to complete our understanding of the COPC list and then for the remainder of the soil areas use a revised list and a revised soil depth (e.g., delinetiaon shows no VOCs or metals and no exceedances below 2ft, therefore no additional depth samples are necessary since no exceedances in the most contaminated areas were noted so its unlikely that areas not expected to be contaminated will exceed at depth >2ft therefore no additional depth samples are needed for VOCs or metals.

Suggested Grouping of comments based on Phase 1 Areas in May 19 email to Katrina	
GENERAL	General comments related to overall approach
IA	Indoor Air for current residents
SWGW	Surface Water-Groundwater Interaction at Loraine & Wilcox Refinery Areas
SSS	Surface Soils delineation around the Sweetening Area (area with highest lead concentrations) in the Wilcox Refinery – see attached delineation approach methodology
RW	Abandon conduit wells (i.e. church well)
COPC	Areas focused on COPC presence based on CSM (for dioxin, basing decision units around the distillation tanks; for PCB, transformer and heat transfer fluids areas; and for TENORM/NORM, sedimentation ponds and equipment cleaning and scale removal areas. The SAP would need to focus in on the potential source area for each COPC and develop decision units for each COPC)
OSOURCE	Suspected individual sources – move to Phase II if funding is constrained
BKGD	Site Background Study – move to Phase II if funding is constrained
PHASE2	All phase 2 areas

Wilcox Oil RI/FS Sample Comparison

Media/Area of Concern	Draft SAP samples	Proposed field samples	Rationale for new locations	Differences	
Vapor Intrusion	3 houses	4 house + possibly more	Sample only current residents & if near source or on a tank pad. Need to survey structures and conduct home inventory first.	Include houses north of east tank farm	why?
Drainage Ditches	19 samples	27 samples (w/triplicates)	Decisions Units for each 'arm' and multiple for larger segments - DU will need to be sized appropriately	-8 samples	
Lorraine Soil Borings	25 borings	11 borings	Characterize based on threat to Sand Creek and keep borings at #4, 9, 11-17, 19, 23. For #4, 9, 12, 16 & 17 pick 5 depths and correlate with ROST data.	+14 borings	
North Area Soil Borings	20 borings	0 borings	Area unlikely an immediate threat, but will be addressed in subsequent phases	+20 borings	Based on what data? Sources at the surface. Resident in the area.
Eastern Tank Farm Soil Borings	295 samples	243 samples	Characterize based on threat to tributary to Sand Creek, use 9 DU hotspot strategy (w/triplicates) and keep borings around tanks 1 ,3 and 4. Consider use of real time analysis (ultraviolet fluorescence, onsite lab) or rapid turnaround from fixed lab on initial samples in center of source area, to determine need for further delineation of DUs further from source. If initial DUs are < action level there will be a reduction in # of DUs required for sampling.	+52 samples	
Wilcox Soil Borings	49 borings	32 borings	Characterize based on threat to tributaries to Sand Creek and keep borings along tributaries and creek (#2, 4, 7, 10, 14, 15, 20-28, 31, 33, 35, 38, 40-48)). For locations pick 5 depths and correlate with ROST data (#2, 4 , 7, 10, 14, 15, 21, 25-27, 33, 44, 46-48)	+17 borings	
Surface Water	33 sediment samples & 43 surface water samples	Use IR with piezometers placed in locations with temperature differences in Sand Creek and East Tributary and possible with an assessment tool	Groundwater to surface water characterization using real-time measurement and interaction verification with piezometers	+76 samples	
Waste Characterization	Keep				
Groundwater Sampling	Keep but use interface probe				

To Be Considered:

Delineation Source Areas
Decision Units/Areas for COPCs
Background Study